AMENDMENTS TO THE CLAIMS

Please amend Claims 1, 27, 28 and 36 as indicated below.

1. (Currently Amended) A method for growing amorphous oxide thin films on a substrate in a reactor, comprising producing the films by the Atomic Layer Epitaxy (ALE) process at a temperature of 150 to 400°C by feeding pulses of precursor compounds into the reactor alternately to achieve film growth through saturating surface reactions and by purging the reactor with an inert gas between the precursor pulses to provide alternate self-limiting surface reactions on the substrate, wherein the precursor compounds comprise:

at least one cyclopentadienyl compound of strontium and/or barium;

at least one volatile titanium compound; and

a reactive oxygen precursor.

2. (Previously Presented) The method according to Claim 1, wherein the oxide thin film is dielectric.

3. (Previously Presented) The method according to Claim 1, wherein said method comprises 1-10 growth cycles in succession, wherein one growth cycle comprises:

feeding of a Ba compound, a Sr compound or a volatile titanium compound;

an inert purge;

feeding a reactive oxygen precursor; and

a second inert purge.

4. (Previously Presented) The method according to Claim 1, wherein the ratio of the at least one cyclopentadienyl compound of strontium and/or barium and the at least one volatile titanium compound is 0.8-1.2.

5. (Previously Presented) The method according to Claim 1, wherein the volatile titanium compound is selected from the group consisting of a titanium halide, a titanium alkoxide, titanium nitrate ($Ti(NO_3)_4$), an alkylamino complex of titanium, a cyclopentadienyl complex of titanium, a silylamido complex of titanium, titanium dialkyldithiocarbamate, and a titanium-β-diketonate.

6. (Previously Presented) The method according to Claim 1, wherein the substrate is selected from the group consisting of a platinum (Pt), RuO_2, IrO_2, $SrRuO_3$, $LaSrCoO_3$, IrO_2/Ir, RuO_2/Pt, silica (SiO_2), silicon nitride and a silicon surface.

7. (Previously Presented) The method according to Claim 1, wherein the reactive oxygen precursor is selected from the group consisting of oxygen (O_2), water vapor, hydrogen peroxide, an aqueous solution of hydrogen peroxide, ozone, and a combination thereof.

8. (Previously Presented) The method according to Claim 1, wherein the at least one cyclopentadienyl compound of strontium and/or barium is $M(Cp)_2$ or $M(Cp)_2L_n$, where

- M is Sr or Ba,
- Cp is a fused or single cyclopentadienyl group of the form $C_5R_mH_{5-m}$, where
- m is an integer 0-5 and
- R is a hydrocarbon group, wherein the m hydrocarbon groups are either the same or different,
- the Cp groups are either the same or different,
- L_n is a neutral adduct ligand which binds to the metal by one or several of the atoms in said neutral adduct ligand.

9. (Previously Presented) The method according to Claim 1, wherein

- the at least one cyclopentadienyl compound of strontium and/or barium is $M(Cp)X$ or $M(Cp)XL_n$, where
- M is Sr or Ba,
- Cp is a fused or single cyclopentadienyl group $C_5R_mH_{5-m}$, where
- m is an integer 0-5 and
- R is a hydrocarbon group, wherein the m R's are either the same or different,
- X is a ligand having a valence of -1, wherein X is not a cyclopentadienyl group and
- L is a neutral adduct ligand which binds to the metal by one or several of the atoms making up said neutral adduct ligand.

10. (Previously Presented) The method according to Claim 9, wherein the cyclopentadienyl group is selected from the group consisting of cyclopentadienyl, pentamethylcyclopentadienyl, triisopropylcyclopentadienyl, indenyl, and fluorenyl.

11. (Previously Presented) The method according to Claim 8, wherein the two Cp groups are joined by a bridge.

12. (Previously Presented) The method according to Claim 11, wherein the bridge between the two Cp groups is a substituted or unsubstituted C_1 - C_6 carbon chain.

13. (Previously Presented) The method according to Claim 12, wherein the carbon chain forming the bridge contains a heteroatom selected from the group consisting of silicon, nitrogen, phosphorus, selenium, and sulfur.

14. (Previously Presented) The method according to Claim 9, wherein R is a substituted or unsubstituted, cyclic, linear or branched group selected from the group consisting of an alkyl, an alkenyl, an aryl, an alkylaryl, an arylalkyl, an alkoxy, a thio, an amino, a cyano and a silyl group.

15. (Previously Presented) The method according to Claim 9, wherein the neutral adduct ligand L is selected from the group consisting of:

(i) a hydrocarbon,

(ii) an oxygen-containing hydrocarbon,

(iii) a nitrogen-containing hydrocarbon,

(iv) a sulfur-containing hydrocarbon,

(v) a phosphorus-containing hydrocarbon,

(vi) an arsenic-containing hydrocarbon,

(vii) a selenium-containing hydrocarbon,

(viii) a tellurium-containing hydrocarbon,

and a combination thereof.

16. (Previously Presented) The method according to Claim 9, wherein L is selected from the group consisting of:

(a) an amine or polyamine,

(b) a bipyridine,

(c) a ligand depicted by the formula

, where G is -O-, -S-, or -NR^1-, where R^1 is hydrogen or a substituted or unsubstituted, cyclic, linear or branched group selected from the group consisting of an alkyl, an alkenyl, an aryl, an alkylaryl, an arylalkyl, an alkoxy, a thio, a cyano and a silyl group, and wherein each carbon atom of the ring according the

formula has an R^1-like substituent, wherein the substituents are either the same or different,

(d) ether, and

(e) thioether.

17. (Previously Presented) The method according to Claim 9, wherein L is selected from the group consisting of an ether, a polyether, an amine, a polyamine, bipyridine and tetrahydrofuran.

18. (Previously Presented) The method according to Claim 9, wherein X is selected from the group consisting of a β-ketonate, a corresponding sulfur or nitrogen compound, an alkyl, a halide, an amide, an alkoxide, a carboxylate and a Schiff base.

19. (Previously Presented) The method according to Claim 1, wherein the producing of the film takes place at 250-300°C.

20. (Original) The method according to Claim 3, wherein said method comprises 1-2 growth cycles.

21. (Original) The method according to Claim 9, wherein the cyclopentadienyl group is selected from the group consisting of cyclopentadienyl, pentamethylcyclopentadienyl, triisopropylcyclopentadienyl, indenyl, and fluorenyl.

22. (Original) The method according to Claim 9, wherein R is a substituted or unsubstituted, cyclic, linear or branched group selected from the group consisting of an alkyl, an alkenyl, an aryl, an alkylaryl, an arylalkyl, an alkoxy, a thio, an amino, a cyano and a silyl group.

23. (Original) The method according to Claim 9, wherein the neutral adduct ligand L is selected from the group consisting of:

(i) a hydrocarbon,

(ii) an oxygen-containing hydrocarbon,

(iii) a nitrogen-containing hydrocarbon,

(iv) a sulfur-containing hydrocarbon,

(v) a phosphorus-containing hydrocarbon,

(vi) an arsenic-containing hydrocarbon,

(vii) a selenium-containing hydrocarbon,

(viii) a tellurium-containing hydrocarbon,

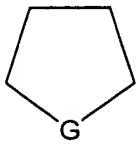
and a combination thereof.

24. (Original) The method according to Claim 9, wherein L is selected from the group consisting of:

(a) an amine or polyamine,

(b) a bipyridine,

(c) a ligand depicted by the formula



, where G is -O-, -S-, or -NR^1-, where R^1 is hydrogen or a substituted or unsubstituted, cyclic, linear or branched group selected from the group consisting of an alkyl, an alkenyl, an aryl, an alkylaryl, an arylalkyl, an alkoxy, a thio, a cyano and a silyl group, and wherein each carbon atom of the ring according the formula has an R^1-like substituent, wherein the substituents are either the same or different,

(d) ether, and

(e) thioether.

25. (Original) The method according to Claim 19, further comprising postannealing said film at a temperature higher than a temperature at which the producing of the film takes place.

26. (Original) The method according to Claim 25, wherein post annealing said film takes place at 500°C.

27. (Currently Amended) A method for growing oxide thin films on a substrate in a reactor, comprising producing <u>amorphous</u> **[[**the**]]** films by the Atomic Layer Epitaxy (ALE) process by feeding alternating pulses of precursor compounds into the reactor alternately to achieve film growth through saturating surface reactions and by purging the reactor with an inert gas between the precursor pulses to provide alternate self-limiting surface reactions on the substrate, wherein the precursor compounds comprise:

at least one cyclopentadienyl compound of strontium and/or barium; and

a reactive oxygen precursor.

28. (Currently Amended) A method for growing oxide thin films on a substrate in a reactor by self-limiting Atomic Layer Epitaxy (ALE), comprising producing the films by feeding pulses of precursor compounds into the reactor to achieve film growth through saturating surface reactions, wherein a growth cycle comprises:

feeding a first reactant pulse into the reactor, wherein the first reactant is selected from the group consisting of a cyclopentadienyl compound of strontium and a cyclopentadienyl compound of barium;

purging the first reactant from the reactor with an inert gas;

pulsing a second reactant pulse into the reactor, the second reactant comprising oxygen;

purging the second reactant from the reactor with an inert gas;

pulsing a third reactant pulse into the reactor, the third reactant comprising a volatile titanium compound; and

purging the third reactant from the reactor with an inert gas,

wherein the second reactant is pulsed between pulses of the first reactant and the third reactant and the deposition temperature is from 100 to 400°C.

29. (Previously Presented) The method of Claim 28, wherein no more than one molecular layer is deposited onto the substrate per growth cycle.

30. (Previously Presented) The method of Claim 28, wherein the first reactant is a cyclopentadienyl compound of strontium.

31. (Previously Presented) The method of Claim 30, wherein the growth cycle further comprises:

pulsing a fourth reactant pulse into the reactor, the fourth reactant comprising a cyclopentadienyl compound of barium; and

purging the fourth reactant from the reactor with an inert gas.

32. (Previously Presented) The method of Claim 30, wherein the growth cycle comprises, in order, pulsing the first reactant, purging the first reactant, pulsing the second reactant, purging the second reactant, pulsing the third reactant and purging the third reactant.

33. (Previously Presented) The method of Claim 30, wherein the growth cycle comprises, in order, pulsing the third reactant, purging the third reactant, pulsing the second

reactant, purging the second reactant, pulsing the first reactant, purging the first reactant, pulsing the second reactant and purging the second reactant.

34. (Previously Presented) The method of Claim 28, wherein the first reactant is a cyclopentadienyl compound of barium.

35. (Previously Presented) The method of Claim 34, wherein each cycle further comprises:

pulsing a fourth reactant pulse into the reactor, the fourth reactant comprising a cyclopentadienyl compound of strontium; and

removing the fourth reactant from the reactor with an inert gas.

36. (Currently Amended) A method for growing oxide thin films on a substrate in a reactor by the Atomic Layer Epitaxy (ALE) process at a temperature of 150 to 400°C, the process alternately comprising at least three different growth cycles comprising saturating, self-limiting surface reactions on the substrate, wherein:

a first growth cycle comprises feeding a pulse of a cyclopentadienyl compound of strontium into the reactor;

purging the reactor with an inert gas;

feeding a pulse of a reactive oxygen precursor into the reactor; and

purging the reactor with an inert gas; and

a second growth cycle comprises feeding a pulse of a volatile titanium compound into the reactor;

purging the reactor with an inert gas;

feeding a pulse of a reactive oxygen precursor into the reactor; and

purging the reactor with an inert gas; and

a third growth cycle comprises feeding a pulse of a cyclopentadienyl compound of barium into the reactor;

purging the reactor with an inert gas;

feeding a pulse of a reactive oxygen precursor into the reactor; and

purging the reactor with an inert gas.

37. (Previously Presented) The method of Claim 36, wherein said method comprises repeating the first growth cycle, the second growth cycle, or the third growth cycle from 1 to 10 times in succession.

38. (Previously Presented) The method of Claim 37, wherein the ratio of the number of first growth cycles to the number of second growth cycles is 0.8 — 1.2.

39. (Previously Presented) The method of Claim 37, wherein the ratio of the number of third growth cycles to the number of second growth cycles is 0.8 — 1.2.